BioSense

A National Program for Supporting Early Event Detection and Situational Awareness

Background

Traditional public health surveillance and investigations often involve the manual reporting of cases to public health agencies and phone calls to healthcare providers for more detailed patient chart information. The timeliness, completeness, and breadth of coverage of these manual processes can be problematic especially during a public health emergency. With increasing amounts of healthcare and health-related data in electronic form and a national focus on the value of exchanging health data electronically, there are now opportunities to use existing electronic data to better support public health functions.

BioSense is a national program to advance this new type of biosurveillance at the national, state, and local levels. Using streams of health data and advanced algorithms for analyzing and visualizing these data streams, the new methods supported by BioSense address the needs of monitoring for infectious diseases, for biological and chemical attacks, and for naturally occurring emergencies. BioSense supports the situational awareness necessary to confirm and identify possible events, to track and manage their size and spread, and to provide public health and government decision makers the information needed to manage preparedness and response.

CDC's Public Health Information Network (PHIN)

Just as there are many organizations and information systems involved in health care, there are many organizations and systems that are critical for biosurveillance and public health.

The Public Health Information Network (PHIN) is CDC's architecture for advancing fully capable and interoperable information systems in the many organizations that participate in public health and ensuring that these systems connect to broader national health IT activities. PHIN is a national, multi-organizational business and technical architecture for public health information systems. At the core of PHIN are accepted health data and technical standards including HL7, SNOMED, and LOINC.

BioSense and PHIN

BioSense is a component of the PHIN architecture that advances the nation's capabilities for biosurveillance as well as connecting and coordinating biosurveillance systems at the local, state, and national levels. BioSense, as part of PHIN, is immediately advancing biosurveillance capabilities, while also using PHIN standards and architecture to advance interoperable biosurveillance systems and health information technology nationally.

Real-time Situational Awareness and BioSense

It is CDC's vision to seamlessly and immediately exchange appropriate and secure data with the healthcare sector to advance a healthier America. BioSense is the national program designed to improve the nation's capabilities for real-time biosurveillance and situational awareness at a time when the vast number of health-related information systems that exist nationally vary in their ability to share data to support immediate biosurveillance needs.

The BioSense strategy to support immediate and developing biosurveillance needs has three elements:

1. Immediately implement real-time clinical connections with major metropolitan area hospital emergency departments.

2. Use timely existing data from hospital systems (including the DoD, the VA and large private networks), national labs, claims clearinghouses and other existing sources of data to provide a near real-time detailed national picture.

3. Through PHIN, promote the connection of biosurveillance and health systems nationally so that all appropriate data become available in real-time to support biosurveillance needs.

In combination, these three strategies provide immediate capabilities for biosurveillance needs and push toward the interoperability necessary to provide even broader real-time capabilities in the near future.

DEPARTMENT OF HEALTH AND HUMAN SERVICES
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Frequently Asked Questions about BioSense, Early Event Detection and Situational Awareness

Why Real-time Clinical Connections?

Critical Information for the Nation

In public health emergencies decisions need to be made quickly. Frequently the best way to minimize morbidity and mortality in an event is to rapidly manage those who have been exposed and prevent others from ever being exposed. In some circumstances, the early management of a single case of a communicable disease can prevent many cases of that disease from ever occurring. Knowing in detail where threats exist is a critical component of timely response. By providing access to data from hospitals and healthcare systems in major metropolitan cities across the nation, BioSense is connecting existing health information to public health in a way not previously possible. It is providing the immediate, constant, and comparable information needed to inform local and state public health and to support national preparedness.

Will BioSense detect diseases before physicians and public health investigators do?

Initial Detection and Situational Awareness

Using electronic data sources to try to look for unidentified, emerging health events is a promising area of research and development. BioSense is supporting the development of algorithms and approaches to make sure that all events that can be first identified in data are recognized as early as possible. While this type of initial detection is promising, the use of heath-related data for situational awareness is proven and critical. Situational awareness for health events includes confirming a possible event that may have been identified by a clinician, a public health professional, an environmental monitor or information from other sources, understanding the size of the event, tracking its location and spread, managing the known cases and assessing the impact of response activities.

Why are standards so important?

Useful Information When and Where it is Needed

Biosurveillance involves data that exist in information systems in many different public health and health care information systems. These massive quantities of data must be accumulated, processed with advanced algorithms, and compared to make them useful for biosurveillance needs. Without data standards, it is extremely difficult to compare data. Without technical standards, it is extremely difficult to connect the information systems so as to have the data to compare. Data and technical standards are a critical part of the success of any information systems activity.

Shared standards are a major reason that PHIN is so tightly coordinated with the activities of the Office of the National Coordinator for Health Information Technology (ONCHIT).

Can BioSense be used to help with the monitoring of diseases like influenza?

BioSense and Influenza

Early detection and situational awareness are important parts of routine disease monitoring and will be critical if there is another influenza pandemic. BioSense connections of health-related data to public health can help provide the situational awareness that will be necessary in pandemic influenza and other naturally occurring emergencies.

How are BioWatch and BioSense Related?

Environmental Information and Biosurveillance

Environmental results from BioWatch are integrated into the BioSense software system so that environmental data can be correlated with human health data to provide integrated situational awareness. Coordinating BioWatch and BioSense has also been important because of the many public health needs for these same lab tests.

For more information: www.cdc.gov/phin/biosense

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